

DiVesta Civil Engineering Associates, Inc.

July 14, 2020

Mr. Eric Joosten
Chairman
Environmental Protection Commission
Town of Darien
2 Renshaw Road
Darien, CT 06820

Re: Palladian Builders, LLC Subdivision – 49 Sunswyck Road, Darien, CT

Dear Mr. Joosten:

The following is offered in response to review comments prepared by Mr. Steve Trinkaus, P.E. of Trinkaus Engineering, LLC, dated July 1, 2020, regarding the above referenced property.

Sewage Disposal Systems:

1. Per the State of Connecticut Health code the bottom of the system has to be 4-feet above ledge rock with 2-feet of natural occurring soil before select fill can be brought in. The proposed design meets this requirement. Literature suggests that wetlands have been found to play a major role in attenuation of nitrate from domestic sewage. Wetlands are a means of protecting surface water bodies from excessive nitrate loading.
2. A proprietary system by Geomatrix is an approved system per the State Health Code. The GST system is very similar to a stone trench system in that it uses stone with the exception of placing alternating fins of sand between the stone fins and with a distribution pipe along the top of the stone.
3. The CT DEP Design Manual is for flow greater than 7500 GPD, therefore it does not apply. The daily design flow from the proposed 4 bedroom residence will be 525 GPD. There is no requirement from the Darien Health Department or the EPC for such analysis. The State of CT design manual states “There are many other nitrogen sources in the environment which also will contribute nitrates to the groundwater, such as fertilizer, rotting vegetation and atmosphere itself. For this reason, it is usually not practical or necessary to try to design small subsurface sewage disposal systems for nitrate removal.” The exception to this might be around a lake which is densely populated with small lots and on septic systems.

Stormwater Management:

1. The Operation and Maintenance narrative states the catch basin and the junction boxes sumps are to be cleaned bi-annually along with the cleaning of the roof leaders. The removal of the accumulated sediment will prolong the

function of the infiltration systems. The use of deep sumps in the catch basins and junction boxes makes it easy for a homeowner with a post hole digger to clean out the accumulated sediment and debris.

2. The front drainage system has a catch basin with a 2-foot sump and a hood on the outlet pipe, there is a junction box with a 2-foot sump as well. These two structures are in line with the detention system. There is also an open bottom to the junction box. There are also two overflow/inspection grates on the inlet end and outlet end of the detention system.

The rear drainage system has a junction box in line with a 2-foot sump. There are also two overflow/inspection grates on each end of the detention system. This detention system is only collecting roof runoff.

3. There are two 2-foot sumps in the front drainage system, one in the catch basin and one in the junction box. There is also a hood to trap the floatables with the runoff. It is our professional opinion that with proper maintenance, bi-annually, the catch basin and the junction box should remove most of the sediment.
4. The rear yard detention system does meet the water quality volume. The WQV at elevation 46.15 is 331 cubic feet; the outlet elevation of the detention system is at 46.25, therefore the volume is met. See the attached WQV calculations. The front yard detention system also meets the WQV. The WQV at elevation 48.0 is 247 cubic feet, therefore this volume is met. See the attached WQV calculations.
5. Calculations demonstrate that the GRV for the front and rear detention systems will fully infiltrate the GRV. See the attached GRV calculations.
6. An additional percolation test was conducted on the north end of the rear drainage system at a depth of 28-inches. Test results can be found on the site plan.
7. The Town of Darien's standard practice is to use percolation tests for the rate of infiltration. The hydraulic gradient in the area of the detention systems will provide infiltration not just through the bottom but also through the sides. In fact this Commission has approved many of our designs using percolation tests.
8. A safety factor of fifty percent of the actual percolation rate was used for the infiltration rate for the detention systems per the Storm Water Quality Manual.
9. In a perfect world to maintain 3-feet above groundwater or ledge would be ideal, but to find 3-feet above groundwater in Darien could prove to be difficult. By limiting the bottom of the detention systems to 12-inches it limits the area of disturbance. In fact the standard practice within Darien is to maintain 12-inches above groundwater.
10. The Town of Darien standard practice is to maintain a separation distance of 12-inches above groundwater.
11. The Town of Darien standard practice is to maintain a separation distance of 12-inches above groundwater.
12. The pool location and size is only feasibility.

13. Reviewing the HydroCAD computer model and the peak elevations for all storms analyzed, the volume of storage above the peak elevation in the Cultec units ranges from 5,140 gallons to 4,204 gallons depending on the storm event. The smaller storm events will have extra storage capacity versus the large storm events.
14. In accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control manual the use of a level spreader lip for higher flows and a permanent installation, a rigid lip of non-erodible material, such as pressure – treated timber or concrete curbing shall be used. We are proposing a pressure-treated timber as our rigid lip for the spreaders and raising the existing grade at the end of the spreaders by 6-inches to ensure the runoff does not leave the ends of the systems.
15. The volume of runoff has been reduced by providing an open detention system, meaning runoff can exfiltrate from the Cultec units. In addition, the Town of Darien’s requirement is to use the “fresh meadow” approach in determining the pre development runoff, therefore we do not get credit for any of the existing impervious areas. The total existing impervious area is approximately 9784 square feet. The total proposed impervious area is approximately 9370 square feet, therefore there is a reduction of approximately 414 square feet of impervious area. Reviewing the computer model the volume of runoff is decreased for all storm events analyzed. See the summary table below for the peak rate of runoff and the volume of runoff.

	2 Year storm event		10 year storm event		25 year storm event		50 year storm event	
	cfs	cf	cfs	cf	cfs	cf	cfs	cf
Pre Development	4.14	14,593	8.04	28,140	9.70	34,020	11.37	40,032
Post Development	3.75	12,676	7.54	25,657	9.24	31,015	10.89	36,721
Difference	.39	1,917	.5	2,483	.46	3,005	.48	3,311

16. The Town of Darien’s standard practice is to be a minimum of 12-inches above groundwater. Percolation test was done within the area of the front detention system. Test results can be found on the site plan.
17. The proposed system is an open system meaning runoff can exfiltrate into the surrounding soil. The HydroCAD computer model has been revised to include the exfiltration rate from the detention system.
18. The proposed detention system proves that there will be a reduction in the peak rate of runoff as well as a reduction in volume of runoff from this site as indicated in the above table in item # 15.

We trust that we satisfactorily addressed the comments from Mr. Trinkaus, PE, dated July 1, 2020

Very Truly Yours,
DiVesta Civil Engineering Associates, Inc.

Douglas DiVesta

Douglas DiVesta, PE
President

DD/dd

20-015 – ltr Joosten 07-09-20

CC: J. Pagliarulo
S. Oresman